STORMWATER 1: MILL CREEK WATERSHED, PHILADELPHIA 3.1

Grant Project Summary

The intent of the Mill Creek Watershed Project was to demonstrate potential alternatives for reducing stormwater run-off in the urban environment, while at the same time enhancing the community that resides within the Mill Creek Watershed. One of the main focuses of this project was to show how innovative stormwater best management practices (BMP) could be replicated throughout the city on vacant and abandoned land, thereby transforming the landscape while also encouraging environmental sustainability.

Grant Title and Administration

The Philadelphia Water Department received a grant from Pennsylvania's Department of Environment to work on a redevelopment project along the Mill Creek Watershed in West Philadelphia. In order to qualify for the grant, applicant proposals needed show that their projects would reduce the amount of stormwater entering a CSO as well as cleanse water that does enter the combined sewer.

Grantor: Pennsylvania Department of Environment, Growing Greener Grant Project
"The Growing Greener Program signed into law by Gov. Tom Ridge in 1999 will invest nearly $650 million over the following five years to preserve farmland and protect open space; eliminate the maintenance backlog in State Parks; clean up abandoned mines and restore watersheds; and provide new and upgraded water and sewer systems." (Growing Greener)

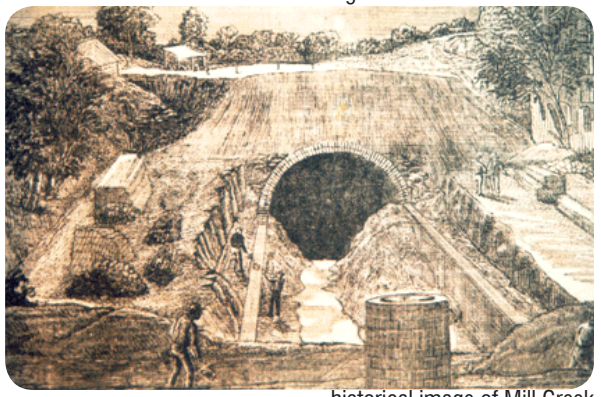
Grant Description

Working with partners at the Sulzberger Middle School, the University of Pennsylvania, and the Mill Creek Coalition in West Philadelphia, the Philadelphia Water Department's Office of Watersheds implemented an innovative stormwater management demonstration project adjacent to a school in the Mill Creek/Schuylkill River watershed. This project reduced the amount of stormwater entering the Mill Creek CSO while also improving the quality of water that does eventually find its way into the sewer. This demonstration project also enhanced the community by creating a garden on what was once a trash ridden vacant lot. Sulzberger Middle School has also benefited, as it used the design, construction, and maintenance of the garden as part of their environmental curriculum.

Grant Deliverables

- Set of Reproducible Best Management Practices (BMP)
- BMP Demonstration
- Environmental Curriculum for Sulzberger Middle School
- Summer Work Project for Community
- Work with Other City Agencies to Target Potential Implementation Sites

Sulzberger Middle School in center



historical image of Mill Creek

Grant Implementation

Step 1 : Work with community to identify potential sites.
Step 2 : Determine possible best management practices (BMP) for site.
Step 3 : Work with community to pick demonstration site and BMP.
Step 4 : Design site specifications with community.
Step 5 : Set up summer community work program.
Step 6 : Set up environmental curriculum and summer school program.
Step 7 : Start construction.
Step 8 : Start community work program.
Step 9 : Start summer school program.
Step 10: End construction.

Vacant lot, 48th + Brown

Sulzberger students

View of Sulzberger Middle School from new garden

Grant Demonstration Outcomes

The grant was designed to show how alternative best management practices (BMP) could be replicated within Philadelphia and beyond. The implementation of this grant project came at a particularly unique time for Philadelphia. During the final stages of the grant implementation Philadelphia's mayor announced the "Blight Initiative". This initiative called for the demolition of thousands of Philadelphia's abandoned buildings over the next 5 years. The result would be a city left with a large portion of open or vacant land. After the unveiling of the Blight Initiative the question on everyone's mind was what to do with this vacant land.

The Philadelphia Water Department hoped to have the answer, with their stormwater demonstration project. Although the Mill Creek Demonstration project's actual measured benefit to the reduction of CSOs is small, the Philadelphia Water Department knew that if this project was replicated throughout the city the accumulated result could significantly reduce CSOs. The Philadelphia Water Department, therefore hoped that the Mill Creek Demonstration project would be the answer to the cities new open space initiatives.

The question of what to do with Philadelphia's vacant land is still left to be decided, but the Philadelphia Water Department's demonstration did have an affect on other construction projects in the city. The University of Pennsylvania recently received a grant for $250,000 to replicate one of the alternative BMPs identified through the grant. The Mill Creek Housing Project just received a grant to perform a major restoration, which will include a number of the Best Management Practices into their designs. The restoration plans were influenced by the Mill Creek demonstration project and will include "a small park and a restored natural habitat along the floodplain of the now piped creek." (McDonald). Philadelphia's Spruce Hill Community also adopted one of the BMPs by removing imperious surfaces and replacing them with plantings. The Philadelphia Water Departments Office of Watersheds continues to make connections with development projects within the city and hopes that the replication of BMPs continues.

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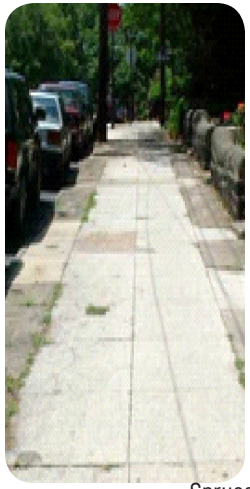
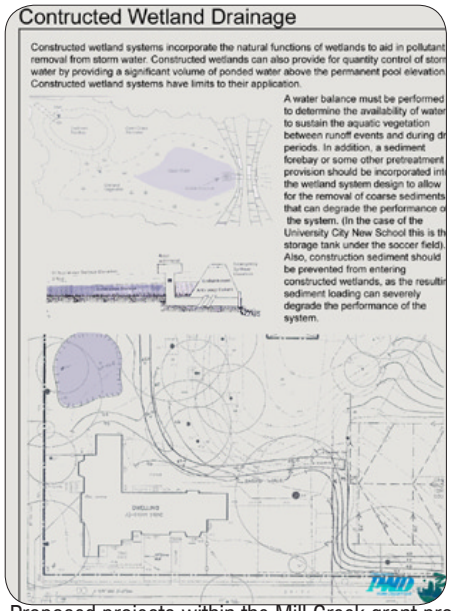
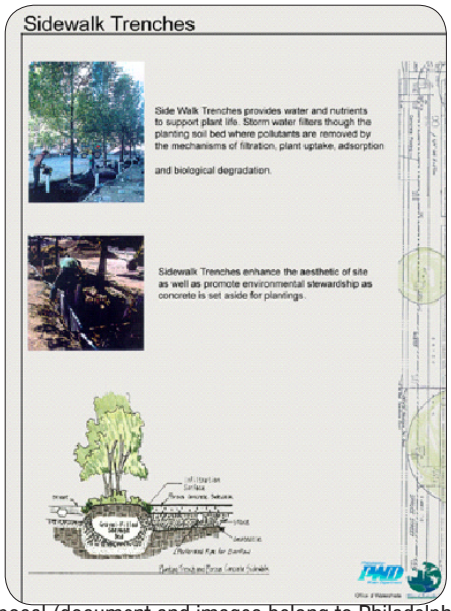
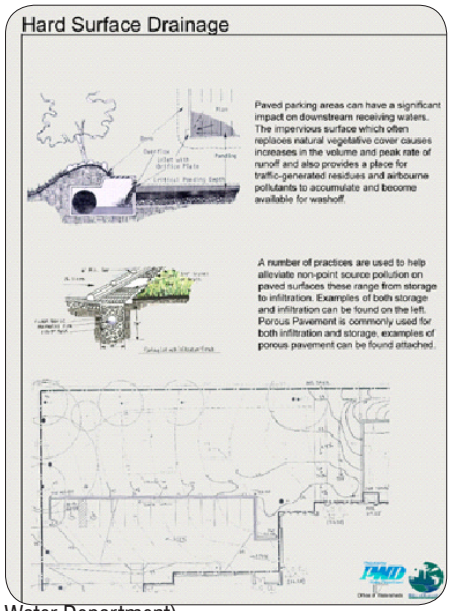
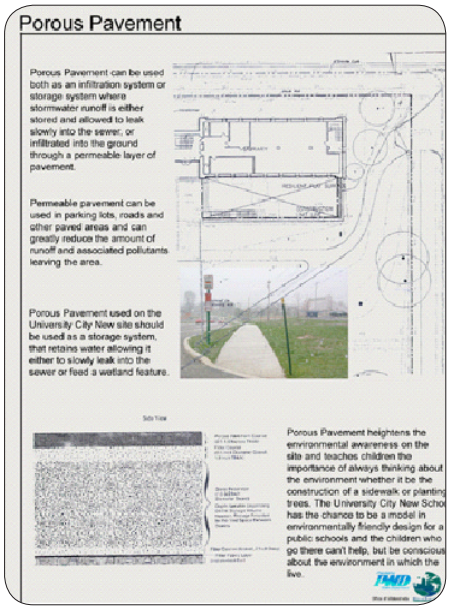


Spruce Hill Community Restoration









Proposed projects within the Mill Creek grant proposal (document and images belong to Philadelphia Water Department)

Project Summary

The Sydney Olympics master plan transformed the Homebush Bay area of Sydney from a setting of "brickworks, slaughterhouses, salt works, landfill, and dumping grounds" to an Olympic park that integrates ecological design. The design takes cues from Homebush Bay's pre-industrial landscape of wetlands and mudflats by creating cleansing wetlands on the site edge. The natural process of these wetland ecosystems provides habitat while also filtering on-site stormwater. These ecological processes are then celebrated along the northern edge as a large fountain that aerates the water and returns it to the wetland system.

Project Goals

- Re-claim a former industrial landscape for cultural and ecological use
- Capture, cleanse, and reuse on site stormwater runoff
- Recreate preexisting habitat, with particular attention to endangered species such as the Green and Golden Bell frogs.
- Demonstrate ecological processes through design, by creating an interpretive wetland and water feature
- Act as a model for ecological reclamation in Sydney

Project Background

Sydney was selected by the International Olympic Committee (IOC) in 1993 to be the host of the 2000 summer games. Sydney's commitment toward an ecologically conscious Olympic games allowed the proposal to be favored by the IOC. Determined to create a master plan that would be heralded for its environmental innovations, Sydney's Olympic Coordination Authority (OCA) created an environmental strategy for the site. This strategy included specific information on the conservation of species (ecosystems and people), the conservation of resources (water, energy, construction material, topsoil), pollution control (air, noise, light, water, soil and sediment, and waste management).

As buildings began to emerge it became clear that the site lacked a cohesive public setting. In reaction to the fragmented appearance of the site, the OCA selected Hargreaves Associates to work with the New South Wales Government Architect Design Directorate (GADD) on the site's Master Concept Design. To give cohesion to the "public domain" the group envisioned three strategic moves, referred to as red, green, and blue. The red "is a major central public space (Olympic Plaza) which unites the buildings and creates large spaces appropriate to the scale of the events and architecture. The green move is the creation of a landscape respite within the urban core, and tree-lined green fingers introduced as the

Northern Water Feature

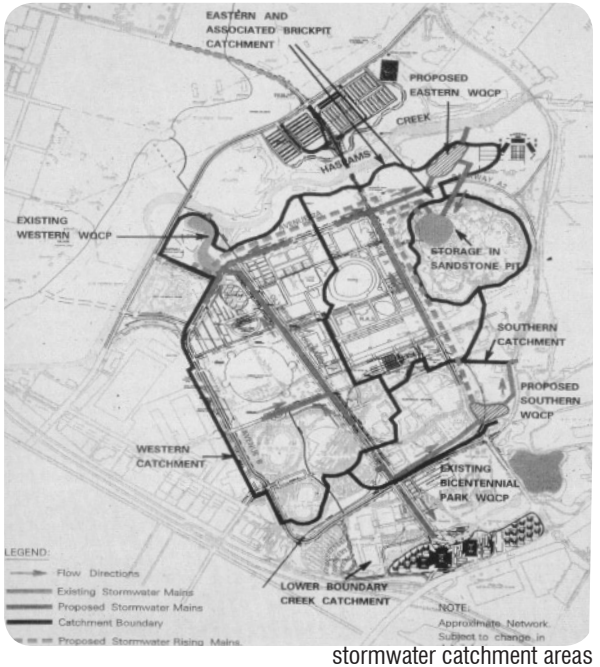
Wetland pond at northern end of Olympic plaza

connection of the plaza to the surrounding parklands. The blue move is the use of water to activate a gathering space at the high point of the plaza and create a connection to the wetland landscape at the low end of the plaza, and the northern water feature." (Kirkwood)

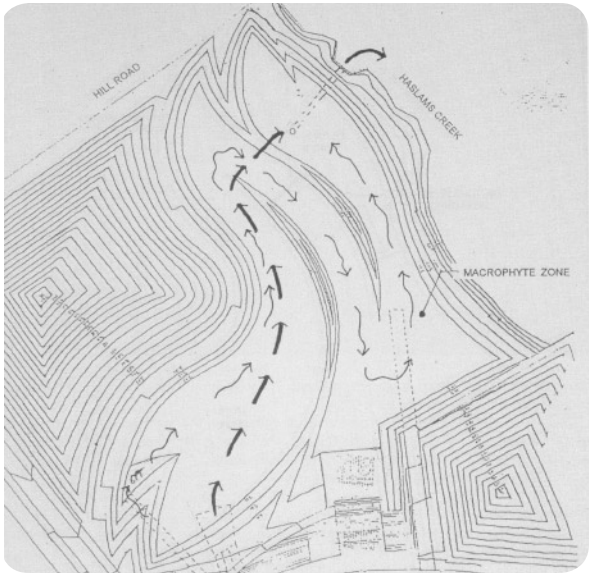
The blue move became the main component embodying the environmental-centered design strategy of the Sydney Olympics. Central to this move was the Northern Water Feature that highlighted the storage, filtration and reuse of site stormwater. The reclamation of this brownfields site along with the re-creation of the natural wetland ecosystems has provided an example for many post industrial cities.

Project Implementation

- Design stormwater system that captures and retains stormwater on site.
- Northern water feature wetland receives stormwater from the western catchments of the site. Some of the water cleansed by the wetland receive further treatment and is used in the Northern Water Feature Fountain.
- Stormwater from the remaining portion of the site will be retained in stormwater ponds, pumped to a larger storage area, treated, and than reused on site for toilets and irrigation.
- Design interpretive wetland that will cleanse stormwater and provide habitat.
- Water from one year storm or less will pass through pollutant trap.
- Water filters through macrophyte zone where it is cleansed.
- Water is "harvested" for on-site use.
- Water is circulated from outlet to inlet pond to maintain water flow.
- Overflow spillway designed for large storm events and outlet blockage.
- Constructed landscape that considered; establishment of wetland plant species, habitat enhancement, water flows, drainage, and mosquito management.
- Design Northern Water Feature that highlights on-site water system process.
- "Ten-meter-high arcs of water fan down the terraces, making visible the cleansing of the site's stormwater..." (Allen)
- Implementation of wetland viewing pier which allows access over and interprets the wetland systems below

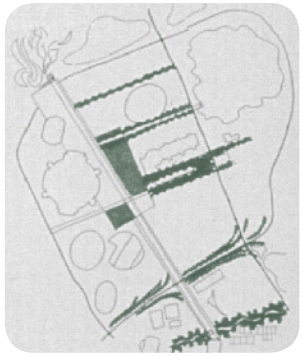


stormwater catchment areas

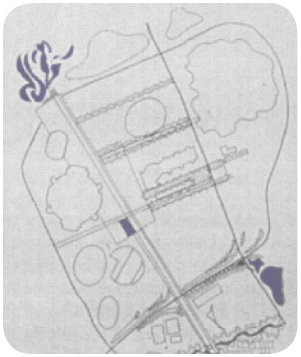


wetland pond flow diagram

Red



Green



Blue

STORMWATER 3: DEVENS FEDERAL MEDICAL CENTER WETLAND, MASSACHUSETTS 3.3

Project Name and Owner

Bioengineered Detention System and Constructed Wetlands, Devens Federal Medical Center
Federal Bureau of Prisons, Devens, Massachusetts

Project Summary

The intent of the Fort Devens Federal Medical Center Project was to create a wetland system that would provide detention and filtration capabilities with the use of native vegetation. The Fort Devens Federal Medical Center Detention Basin and Constructed Wetland was established to: 1) manage stormwater runoff from the Medical Center building and adjacent parking lot, and 2) filter groundwater runoff from lead-contaminated soils. This project is the recipient of the 1997 International Erosion Control Association's Environmental Achievement Award.

Project Design

The interdisciplinary design team, which included The Bioengineering Group, created a series of three ponds along the relocated stream course, relied on vegetation as the basis of channel erosion control in order to maximize the habitat value, and used a dam and weir to allow the channel and pond complex to function as a detention basin. The application of bioengineering as the primary erosion control methodology along the water's edge became the basin's visual focal point, proving both function and aesthetic. The first basin was designed as a sediment trap that could be easily accessed and maintained. The channel flow to the second basin was designed as a heavily planted wetland that provides general biological treatment and filtration of stormwater entering the system. Baffles help optimize water circulation within the wetlands. The third basin was designed with a graceful shape, an island, and a wetland border consisting of native grasses, wildflowers, trees, and shrubs. The design simultaneously addressed erosion and sediment control, stormwater treatment, permit requirements, wildlife habitats and aesthetic features in order to make the most out of a tight budget for sitework.

Project Function

The end result is a project with beauty that changes with the seasons, enhanced by flowing water, the sounds of a waterfall, and the sight of attractive ponds. Most importantly, the water and habitat quality has been enhanced. The individual components of the design conform to cutting edge theory and practice, and the combination of features in a multi-purpose channel and basin complex represents a unique level of professional accomplishment.

Project Highlights

- Bioengineering treatments
- Created wetland for improving water quality
- Plant species diversity for habitat and aesthetics
- Extreme flow and inundation tolerance
- Construction inspection
- Stormwater handling accepted in mitigation wetlands due to functional assessment

wetland under construction

two years following wetland construction

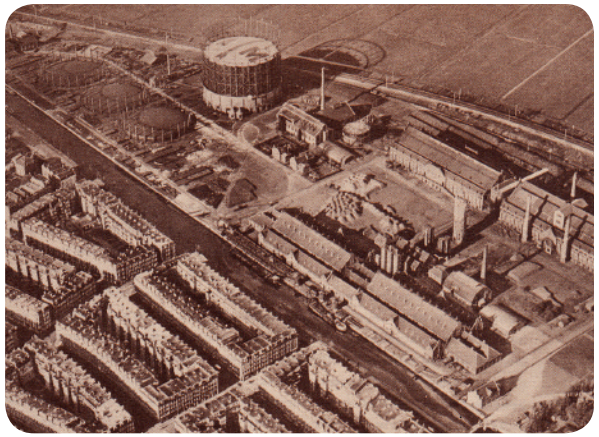
Project Summary

A highly contaminated industrial site in Amsterdam is being re-made into a center for cultural enterprise, recreation, and redevelopment. Most notably, the project managers are using an extensive media campaign, the staging of temporary events on site, and intense community activism to provide short-term catalysts for the site's long-term recovery.

Site and Project Background

Located just north and west of the city center, the Westergasfabriek site covers 15,000 square meters and contains many late nineteenth-century industrial buildings. It was the location of gas production for the city until 1960, though the utility company continued to use the site for storage before it was returned to the city in 1992.

At that time reclamation regulations called for complete removal of contaminated soil as well as demolition of the buildings, at a cost of approximately 200 million gilders. However, the inclusion of the buildings on the Historic Register, and the creation of a local government structure put the site in a new position. Empowered by greater local responsibility for the site, various agencies, community groups and professional designers, engineers and artists sought a new use and identity for the site, while a legislative amendment allowed for a limited clean up based on exposure and risk. The isolation of the site by a canal and rail lines attracted squatters, and the Urban District responded by occupying the buildings with arts groups. Their activities generated a fashionable new aura around the old factory, allowing time and setting a basis for a different approach to site development.



Cultural Enterprise, Community Activism

Two critical project goals were the short-term infusion of activity to the site and the long-term use of the site seven days and nights a week throughout the year. To this end, an events bureau was established early in the project's development in order to rent out existing buildings to cultural organizations. The events were wide-ranging—opera, fashion show, filmmaking, house parties, exhibitions, circus—and they successfully revitalized this formerly isolated site and helped rejuvenate local neighborhoods.

Importantly, project directors have taken advantage of the area's high degree of community activism. Nearby residents have been continuously involved in project meetings and in the design process for a park that will eventually cover a majority of the site.

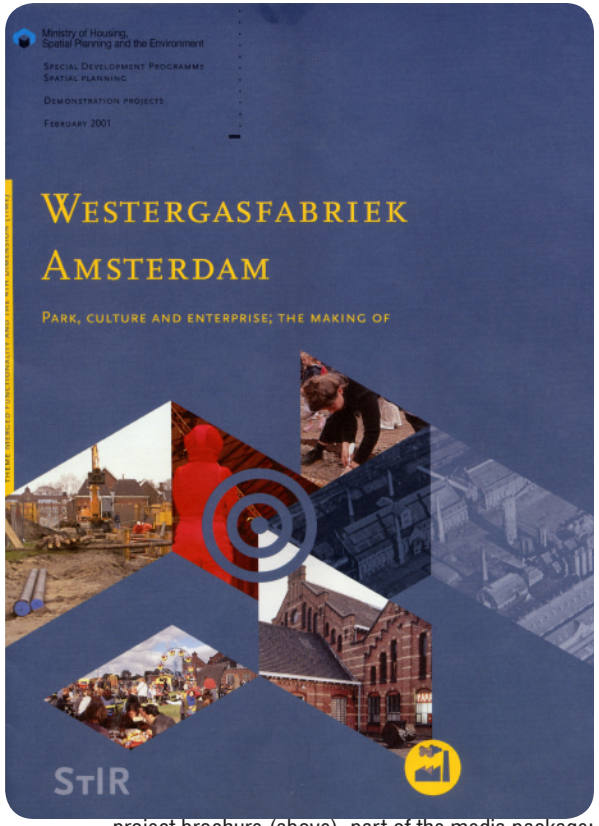
Slow Growth, Cultural and Economic Diversity

The project team is dedicated to building upon many years' worth of pre-development meetings in order to ensure long-term cultural and economic health. Thus, the initial staging of events was specifically intended to bring life back to the site as long-term remediation efforts are underway. Gradually, the park will be built atop and within much of the currently contaminated site. Yet the historic buildings have been retained in order to sustain cultural and economic diversity and round-the-clock activity. Thus, initial events and long-term building renovation and park installation can be viewed as vehicles for economic revitalization.

"You continue the history of the area. The development will never be finished and maybe it never started at a distinct point either." Evert Verhagen, Westergasfabriek project manager

Media, Outreach

Beyond the establishment of an events office and the staging of temporary events on the site, the project team has also developed an intensive media campaign and communications package in order to keep local and regional residents, businesses, and cultural organizations abreast of current events and future developments at the site. To date, posters and postcards have been widely distributed; project brochures have been printed for distribution to cultural and business organizations; and a website was established. Through these efforts, the project team is keeping the project on the front page and in people's minds, thus increasing the chances for long-term viability.



project brochure (above), part of the media package;
fashion show event in existing industrial building (below)